distinctly claim the invention. New claims 71-132 have been added. Neither the amendments nor the new claims add new matter to this application.

Applicants respectfully request entry of this application.

The Commissioner is hereby authorized to debit any payment deficiencies as they relate to the present Preliminary Amendment or credit any overpayments to our deposit account no. 23-0280.

Respectfully submitted,

Dated: September 13, 2001

By: _____

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CERTIFICATE OF MAILING (37 C.F.R. § 1.8a)

I hereby certify that this correspondence is, on the date shown below, being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to: BOX PATENT APPLICATION, Commissioner of Patents, Washington, D.C. 20231 on September 13, 2001.

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Sarah J. Goodnight (130167.1)

ATTACHMENT - Marked-Up Claims

55. (Amended) A reformer reactor for producing hydrogen-rich gas comprising:

[a vessel having] a first zone for containing a reaction stream with reactants, said first zone comprising a partial oxidation reaction vessel having an opening for emission of the reactants into the first zone;

a collection space for collecting gaseous product;

at least one intermediate zone interposed between the first zone and the collection space, wherein at least the intermediate zone immediately adjacent to the first zone contains a catalyst suitable for promoting an endothermic reaction; [and]

a partition separating the first zone from the zone immediately adjacent to the first zone, the partition having a plurality of spaced openings to permit the flow of a reactant stream therethrough; and

a means for directing the heated reactant stream in diverging directions from the first zone to the collection space primarily in the direction coinciding with the direction of a substantial portion of the overall heat flux out of the vessel; wherein the reactor is configured such that heat is transferred to at least the zone immediately adjacent to the first zone so as to support a temperature promoting steam reforming in the presence of the catalyst.

63. (Amended) A reformer reactor for producing hydrogen-rich gas comprising:

a first zone for containing reactants, said first zone containing a partial oxidation reaction vessel having an opening for emission of reactants into the first zone;

at least one other zone within which the first zone is nested; wherein the zone adjacent to the first zone contains a first catalyst suitable for promoting an endothermic reaction such that heat is transferred to the first catalyst from either the reaction stream after the partial oxidation reaction or another zone in the reactor so as to support a temperature for promoting steam reforming in the presence of the first catalyst; and

a boundary between each pair of adjacent zones each said boundary [boundaries] being permeable to [a] the reaction stream so as to permit flow thereof from the first zone to and through each subsequent zone through the respective boundaries therebetween[;], wherein said

flow is in diverging directions from the first zone into at least one of the other zones in which the first zone is nested.

65. (Amended) The reformer reactor of Claim 64 wherein the second zone [containing] contains a suitable catalyst for catalyzing a steam reforming reaction in the reaction stream, the third zone [containing] contains a suitable catalyst for catalyzing a high-temperature shift reaction in the reaction stream, and the fourth zone [containing] contains a suitable catalyst for catalyzing a low-temperature shift reaction in the reaction stream.

66. (Amended) The reactor reformer of Claim [63] 64 wherein the first zone is a cylinder and the three subsequent zones are tubular cylinders all nested coaxially and a closure is provided at axial ends of the cylindrical zones, such that the reaction stream flow is primarily outward from the third zone to and through the third zone.